Patent claims

1. Method for controlling the traffic in an ATM (Asyncrounous Transfer Mode) network so as to maintain the Quality of Service (QoS) thereof by implementing Usage Parameter Control (UPC) comprising at least one leaky bucket unit arranged between an original cell flow of ATM-cells and a switch unit, there being used one counter for each bucket per connection, said counters being incremented and decremented according to predetermined criteria by means of timer counter means, characterized by the combination of the following steps:
- decrementing the bucket counters at regular intervals but only when there are no arriving cells, and
- computing real bucket values for a connection when a cell for said connection arrives.

2. Method as claimed in claim 1, characterized in that said combination of steps are used in connection with two buckets which are arranged in the same process but given different priority, said two buckets preferably being arranged in series.

3. Method as claimed in claim 1 ~~or 2~~, characterized in that there is used a PCR (Peak Cell Rate) bucket as a first bucket and a SCR (Sustainable Cell Rate) bucket as a second bucket, preferably connected in series with said first bucket.

4. Method as claimed in claim 1 ~~any of the claims 1-3~~, characterized in that there is used a dual leaky bucket arrangement comprising an LDLBU (Logical Dual Leaky Bucket Unit) which is adapted for calculating whether an arriving ATM-cell is compliant with

the traffic contract, and which performs said calculation after having read the connection number (n) of the ATM-cell in question (cell I+0) and thereafter the counter values related to that connection (n) from a CT (Counter Table).

5. Method as claimed in claim 4, characterized in that when said calculation is finished the LDLBU will send the new computed counter values to said CT, and depending on whether the ATM-cell is compliant or not will send a Send Cell signal or Not Send Cell Signal, respectively, to a One Cell buffer being part of said dual leaky bucket arrangement.

6. Method as claimed in claim 5, characterized in that if the One Cell buffer receives a Send Cell signal from said logical dual leaky bucket it will pass the cell to a buffer-out unit, whereafter a new cell from a buffer-in unit can be read.

7. Method as claimed in claim 5, characterized in that if the One Cell buffer receives a Not Send Cell Signal from the Logical Dual Leaky Bucket Unit then it will read a new cell from said buffer-in unit that overwrites the old cell.

8. Method as claimed in ~~any of the preceding claims~~ claim 1, characterized in that the incrementing of the PCR and the SCR of each connection is checked at a specific time interval (m), said checking including whether there is an ATM-cell waiting to be processed, and that if no cell is waiting the bucket state will be decremented.

9. Method as claimed in ~~any of the preceding claims~~ claim 1,

characterized in that if a new ATM-cell has arrived, then the real value of the PCR (Peak Cell Rate) bucket is calculated, whereafter said real value is placed in the associated CT (Counter Table), the process thereafter checking whether the real value thereof is greater than the maximum allowed PCR bucket value (T^{PCR}).

10. Method as claimed in claim 9, characterized in that if the real PCR bucket value is greater than a threshold value then a Not Send Cell signal is sent to said One Cell buffer which initiates the process to go to decrement bucket state.

11. Method as claimed in claim 9 ~~or 10~~, characterized in that if the real PCR bucket value is equal or lower than said threshold value then the virtual value of said PCR bucket (L^{PCR}) will be incremented by an appropriate increment factor (I^{PCR}), whereafter the process will calculate the real value of said SCR bucket which value is placed in the associated CT (Counter Table) as a real value (F^{SCR}) for said connection.

12. Method as claimed in claim 9 ~~any of the claims 9-11~~, characterized in that the real value (F^{SCR}) of the PCR bucket for a specific connection is checked against the value of the threshold value (T^{SCR}) of said PCR bucket for said connection, and if said real value is greater than said threshold value there will be sent a Not Send Cell signal to said One Cell buffer.

13. Method as claimed in claim 12, characterized in that if the real value of said SCR bucket is equal or lower than its threshold value, then the virtual value (L^{SCR}) of said SCR bucket is calculated and a Send Cell signal is sent to said One

Cell buffer, whereafter the process goes to the decrement bucket state.

14. Method as claimed in ~~any of the preceding claims~~ claim 1, characterized in that the decrementing of said buckets takes place by firstly incrementing said time counter (m) for thereafter calculating the virtual value of said PCR and SCR bucket, respectively, for said actual connection number (m), after which calculation the process goes to an idle state.

15. Method as claimed in claim 14, characterized in that the virtual value of any PCR bucket for any connection (n) is decremented by D*M every M'th cell.

16. Method as claimed in ~~any of the preceding claims~~ claim 1, characterized in that there is used only a single time counter for all the connections involved.

17. Method as claimed in ~~any of the preceding claims~~ claim 1, characterized in that the increment value of a second bucket is varied according to appropriate criteria, and more specifically by setting the increment value to zero, possibly for using said method as a single leaky bucket.